

Math 1  
Project 3

The due date of project 3 will be the school day immediately after the exam for module 5. (The date of that exam is yet to be determined.) This information is *not* to be turned in with your project.

For both options, you need to determine equations of lines. At least one of these equations must be in point-slope form, and at least one of these equations must be in standard form.

Option 1: World Traveler

Plan a trip to at least one city on each continent (except Antarctica) that you would like to visit. Your trip must start and end at the city where you live. Your trip must also cross every longitude.

Obtain the latitudes and longitudes of the cities on your trip. (A recommended source is: <http://www.satsig.net/maps/lat-long-finder.htm>) Treat latitude and longitude as grid coordinates. On a flat paper map, draw your route with line segments. For each line segment, determine the equation of the line containing that line segment. Also, determine the domain and range for each line segment of your route; give each domain and range in interval notation. For any line segment that crosses the International Date Line, you must do exactly one of the following to determine the equation, domain, and range correctly:

- Add 360 degrees to the longitude of the “degrees west” city.
- Subtract 360 degrees from the longitude of the “degrees east” city.

Write a story about your trip. Your story should correspond with the order in which you visit your cities on your trip.

You need to turn in the following:

- flat paper map with route drawn
- sheet with equations of paths and interval notation of domain and range of line segments
- story

## Option 2: Flag Designer

Find the flag of an actual country or state, or design your own flag. The flag that you choose or create must include at least two line segments that are neither horizontal nor vertical, at least two line segments that do not pass through the origin, and at least ten line segments total. Superimpose a coordinate system on your flag. (It may be easiest to let the lower left corner of your flag be the origin so that all coordinates are nonnegative.) For at least ten line segments on your flag (at least two of which are neither horizontal nor vertical and at least two of which do not pass through the origin), determine the equation of the line containing that line segment. Also, for the line segments you chose, determine the domain and range. (All mathematical information can be separate from your flag.) Indicate clearly on your flag the line segments for which you are determining the equation, domain, and range.

Write a paper explaining why you chose your flag and explaining the significance of your flag. You also need to describe your flag so that someone who is reading your paper but cannot see your flag can determine what your flag looks like.

You need to turn in the following:

- reproduction of flag with line segments indicated
- sheet with equations of lines and interval notation of domain and range of line segments
- explanation of significance of flag and description of flag

I will be assessing your project as follows:

For C2 (reading), you will earn a green bar if you turn in all materials on time, completed to the best of your ability and as neat as possible, having followed all directions. You will earn a yellow bar if you followed most (but not all) of the directions and/or materials are not as neat as possible, but still readable and/or at least one item is turned in slightly late. You will earn a red bar if some materials are late or missing, several items were completed without following directions, and/or anything is illegible.

For C3 (written communication), you will earn a green bar if your written component corresponds to the type of project that you chose to do, is written clearly and concisely has minimal issues with spelling, grammar, and punctuation. You will earn a yellow bar if there are minor issues in at least two of these areas. You will earn a red bar if there are minor issues in more than two of these areas or if there is a major issue in at least one of these areas.

For C4 (notation), you will earn a green bar if your equations are in the correct format and your graphs are accurate. You will earn a yellow bar if the scale is consistent, but there are at most three minor errors with the format of your equations and/or the locations of points on your graph. You will earn a red bar if the scale is inconsistent or nonexistent, or if there are more than three minor errors or a major error with the format of your equations and/or the locations of points on your graph.

If you choose to create an electronic project, you may earn credit in C6 (technology). I will assess this based on how well you used that technology to complete the project.

For 5A (function features), you will earn a green bar if there is at most one minor error in determining the domain and range of line segments. You will earn a yellow bar if there are at most four minor errors in determining the domain and range of line segments. You will earn a red bar if there are more than four minor errors or a major error in determining the domain and range of line segments.

For 5F (create function), you will earn a green bar if there is at most one minor error in determining the equations of lines. You will earn a yellow bar if there are at most four minor errors in determining the equations of lines. You will earn a red bar if there are more than four minor errors or a major error in determining the equations of lines.